2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential

Med	chan	ical Summa	ry					MECH	I-SUM
2009 Washington State Energy Code Compliance			Forms for Nonresidential a	and Multifamily Re	esidential			Revised December 2010	
Project Info			Project Address					Date	
								For Building I	Dept. Use

			Applicant Name:						
			Applicant Address:						
			Applicant Phone:					1	
Proje	ct Des	scription							
Briefly d	lescribe n	nechanical							
system	type and	features.							
Incl	udes Plar	ns	Include documentation	n requiring con	npliance with	commissioning	g requirements,	Section 1416.	
Com	plianc	e Option	Simple System	O Complex	•	O Systems			
			(See Decision Flowch	art (over) for q	ualifications.	Use separate	MECH-SUM for	simple & com	plex
Equi	pment	Schedules	The following information the plans. For project	tion is required s without plans	to be incorpo s, fill in the rec	rated with the juired informat	mechanical equ tion below.	ipment schedi	ules on
Cooli	ing Eq	uipment Schedu	le				W. C		
Equip.	Equip			Capacity ²	OSA CFM	SEER		Econmizer	Heat
ID	Туре	Brand Name ¹	Model No.1	Btu/h	or Econo?	or EER	IPLV ³	Option or	Recovery
	<u> </u>			 				Exception ⁶	Y/N
				· · · · · · · · · · · · · · · · · · ·					
	ļ						ļ		
	-								
TT					<u> </u>				
		uipment Schedu	le	T					
Equip. ID	Equip Type	Brand Name ¹	Model No. ¹	Capacity ² Btu/h	OSA cfm or Econo?	Input Btuh	Output Btuh	Efficiency ⁴	Heat Recovery Y/N
		nent Schedule							
Equip. ID	Equip Type	1	1	0511					
טו	Type :	Brand Name ¹	Model No. ¹	CFM	SP ¹	HP/BHP	Flow Control ⁵	Location of	f Service
	 					·			
									
	1		1	1					

¹If available. ² As tested according to Table 14-1A through 14-1G. ³ If required. ⁴ COP, HSPF, Combustion Efficiency, or AFUE, as applicable. ⁵ Flow control types: variable air volume(VAV), constant volume (CV), or variable speed (VS). ⁶ Exception number from Section 1433.

Mechanical Summary (back)

MECH-SUM

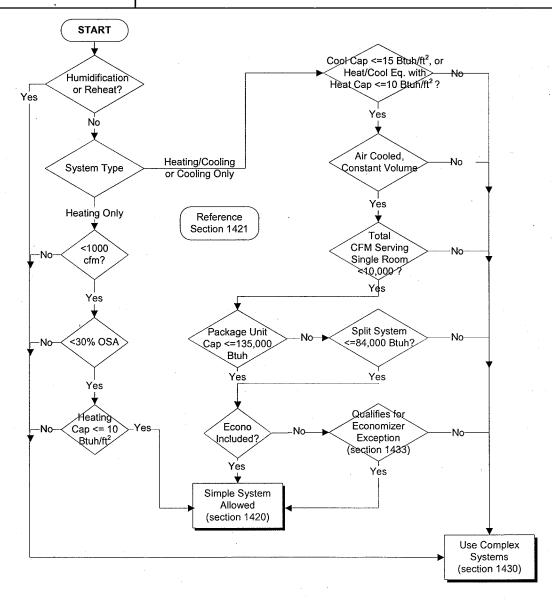
2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential

Revised December 2010

	All Systems:	☐ No humidification?	☐ No Reheat?
System Description	If Heating/Cooling	Constant vol? Split system?	=84,000 Btuh? Economizer
See Section 1421 for full description of Simple System qualifications.	or Cooling Only:	Air cooled? Packaged sys?	=135,000 Btuh?
Simple System qualifications.		Cooling Cap <=15 Btuh/ft²?	Heating Cap. > 0 & <=10 Btuh/ft ² ?
	If Heating Only:	<1000 cfm? <30% outside air	? Heating Cap. <=10 Btuh/ft²?

Decision Flowchart

Use this flowchart to determine if project qualifies for Simple System Option. If not, either the Complex System or Systems Analysis Options must be used.



Complex Systems

Refer to MECH-COMP Mechanical Complex Systems for assistance in determining which Complex Systems requirements are applicable to this project.

2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential

Me	chan	ical Summa	ry					MECH	I-SUM	
				Forms for Nonresidential and Multifamily Residential					Revised December 2010	
Project Info			Project Address					Date		
								For Building I	Dept. Use	
			Applicant Name:					<u> </u>		
			Applicant Address:		15. W.					
			Applicant Phone:							
Project Description							· · · · · · · · · · · · · · · · · · ·			
		nechanical								
system	type and	features.	.							
Inc	ludes Plar	ns	Include documentation	n requiring con	pliance with	commissioning	g requirements,	Section 1416.		
Com	plianc	e Option	O Simple System	○ Complex	-	Systems	-			
			(See Decision Flowch	(See Decision Flowchart (over) for qualifications. Use separate MECH-SUM for simple & complex						
Equi	pment	Schedules	The following information the plans. For project	tion is required ts without plans	to be incorpo s, fill in the rec	orated with the quired informat	mechanical equition below.	uipment sched	ules on	
Cool	ing Eq	uipment Schedu	le						"11"	
Equip. ID	Equip	1		Capacity ²	OSA CFM	SEER		Econmizer	Heat	
	Туре	Brand Name ¹	Model No. ¹	Btu/h	or Econo?	or EER	IPLV ³	Option or Exception ⁶	Recovery Y/N	
								Exception	1714	
	<u> </u>						· · · · · · · · · · · · · · · · · · ·			
Heati	ng Fa	uipment Schedu	<u> </u>	<u> </u>		<u> </u>				
Equip.	Equip	dipinent schedu	16	Capacity ²	OSA cfm		T		Heat	
ÍD	Туре	Brand Name ¹	Model No. ¹	Btu/h	or Econo?	Input Btuh	Output Btuh	Efficiency ⁴	Recovery Y/N	
ļ	ļ									
		·		<u> </u>						
<u></u>										
		nent Schedule								
Equip. ID	Equip Type	Donald No. 1		OEM	1	LID/DUD	E1 0 . 15			
2	Туре	Brand Name ¹	Model No.1	CFM	SP ¹	HP/BHP	Flow Control ⁵	Location of	Service	
				-						
	<u> </u>		<u> </u>							
	<u> </u>									
	I	1	1	1			1		i	

¹If available. ² As tested according to Table 14-1A through 14-1G. ³ If required. ⁴ COP, HSPF, Combustion Efficiency, or AFUE, as applicable. ⁵ Flow control types: variable air volume(VAV), constant volume (CV), or variable speed (VS). ⁶ Exception number from Section 1433.

Mechanical Summary (back)

MECH-SUM

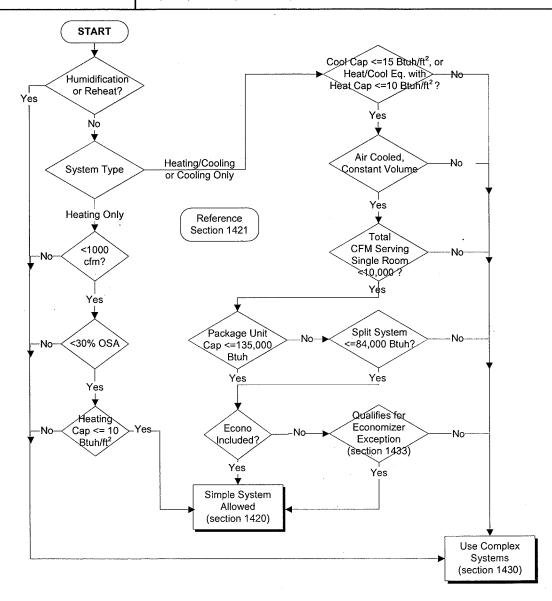
2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential

Revised December 2010

	All Systems:	☐ No humidification?	☐ No Reheat?
System Description	If Heating/Cooling	Constant vol? Split system?	=84,000 Btuh? Economizer
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Simple System qualifications.		Cooling Cap <=15 Btuh/ft²?	Heating Cap. > 0 & <=10 Btuh/ft ² ?
	If Heating Only:	☐ <1000 cfm? ☐ <30% outside air	? Heating Cap. <=10 Btuh/ft²?

Decision Flowchart

Use this flowchart to determine if project qualifies for Simple System Option. If not, either the Complex System or Systems Analysis Options must be used.



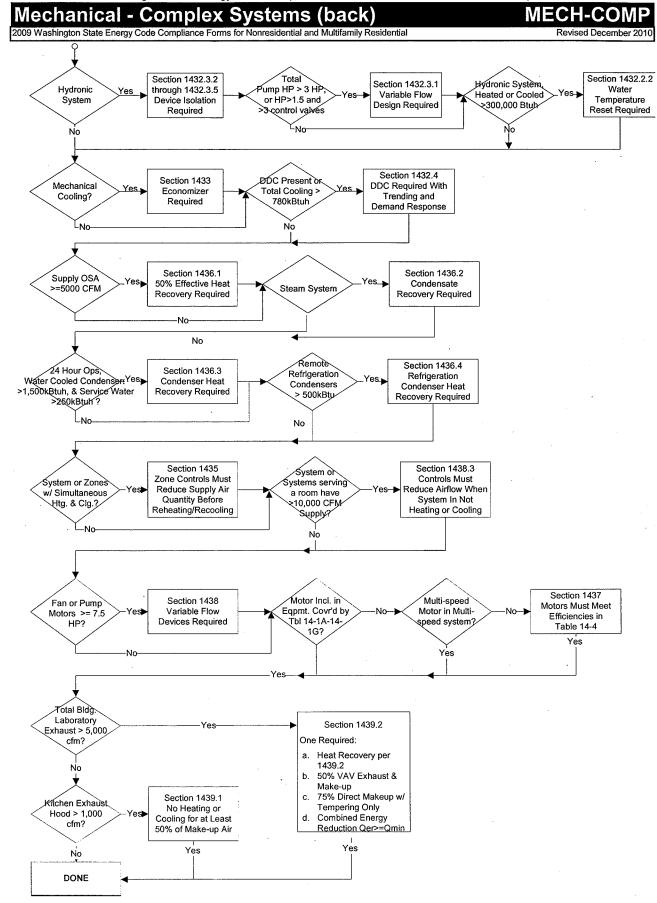
Complex Systems

Refer to MECH-COMP Mechanical Complex Systems for assistance in determining which Complex Systems requirements are applicable to this project.

Mechanical - Complex Systems Checklist 2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Revised December 2010 Project Address For Building Department Use The following additional information is necessary to check a mechanical permit application for a complex mechanical system for compliance with the mechanical requirements in the Washington State Nonresidential Energy Code. Use the checklist as a reference for notes added to the mechanical drawings (see the MECH-CHK checklist for additional requirements). This information must be on the plans since this is the official record of the permit. Having this information in separate specifications alone is NOT an acceptable alternative. Applicability Code Location **Building Department** Information Required (yes, no, na) Section Component on Plans Notes ADDITIONAL CHECKLIST ITEMS FOR COMPLEX SYSTEMS ONLY 1431.1 Field assem, sys. Provide calculations for total onsite energy input/output to equip. 1431.2 System Sizing Indicate equipment & system sizing complies with 1431.2 1432.1 Setback & shut-off Indicate separate systems or show isolation devices on plans 1432.2.1 Air system reset Indicate automatic temperature reset & operation sequence 1432.2.2 Hydr. Sys. reset Indicate automatic temperature reset & operation sequence 1432.3.1 Hydr. Var. Flow Indicate variable flow method for all applicable systems 1432.3.X Hydronic Isolation Indicate method of isolation for all applicable systems 1432.4 **DDC** Capabilities Indicate control capabilities including demand response setpoind adj. 1432.4 DDC data mgmt Indicate metering and trending capabilities. 1432.5 Pressure Reset Indicate static pressure reset for VAV systems Indicate economizer on equipment schedule or provide calculations to 1433 Air Economizer justify exemption. Demonstrate higher efficiency equipment if required. Indicate water economizer and provide calculations showing 1433 Water Economizer compliance with 1413 if 1433 Exception 3 is utilized 1434 Separate air sys. Indicate special requirement zones and indicate systems Indicate method of prohibiting simultaneous heating and cooling, or 1435 Simul. htg. & clg. state excpetion and show supporting calculations Indicate heat recovery of all applicable systems on plans; complete and 1436 Heat recovery attach heat recovery calculations 1437 MECH-MOT or Equip. Schedule with hp, rpm, efficiency Elec. motor effic. 1438 Variable speed drives Indicate VS control or equivalent on schedules for all applicable equip. 1438.1 Heat Rejection Indicate heat rejection equipment types and fan types 1438.2 Hot Gas Bypass Indicate cooling equipment staging and capacity modulation abilities 1438.3 Large Volume sys Indicate multiple system rooms & indicate ventilation control 1439.1 Kitchen Hoods Indicate source and conditioning of make-up air 1439.2 Laboratory Exhaust Indicate HR, VAV, semi-conditioned makeup, or CERM calc

Decision Flowchart Use flowchart to determine how the requirements of the Complex Systems Option apply to the project. Refer to the indicated Code sections for complete information on the requirements. Start Here Section 1411.1 Gas/Oil Furnace Space > 500sf. Áir System Equipment Efficiency Any Fuel Furnace Field-Assembled input $\geq 225,000$ with Design > 25 Serving Multiple Shall Meet Tables input ≥ 225,000 Equipment? Btuh or Any Unit people per 14-1A through 14-1G Zones? Btuh? 1000SE Heater? Yes Yes Yes Yes Yes Section 1412.8 Section 1411.1 Section 1431.1 1411.1 IID & Power Section 1432.2.1 0.75% Maximum Ventilation Controls Calculations of Total Venting or Damper. Supply Air Reset for High-Occupancy Jacket Loss On-Site Energy Input If input ≥ 225,000 Controls Required Areas & Ouput Required Btuh then 1412.6 Modulating Controls Required (continued on back)

If "no" is circled for any question, provide explanation:



conomizer			MECH-EC
9 Washington State Energy Code Complia conomizer Summary	Full Air Econo:	Multifamily Residential	Revised December
eck box(es) for exceptions being		Пене	
imed. List the system/equipment t qualifies for each exception. See	Ex 1:		
ction 1433 for full description of	Ex 2:		Ex 9b:
onomizer requirements.	Ex 3:		Ex 9c:
	Ex 4:		Ex 10:
ecision Flowchart	Use this flowchart to determ requirements. If not, the Sys	ine if project complies with Eco stems Analysis Option must be	nomizer used.
START			
•	Refere Section		
100% Air	es		Full Air Economizer -
Economizer	~		Complies
No		Exception 8:	
Certified Units	Group R Occ. Yes-		_
From Table 14-1A, B, D_Yes SEER / EER 15% Over			Exception 8:
Code	No ▼	No	Unit Cap <54,000 Bitch Yes Unit not Exterior or
No	Exception 1.	Bldg. Cap.	Adjacent
	Unit Cap < 33,000 Blub Yes-	w/o economizer Yes	No !
4	Adjacent	5%?	
	No	No	
*			<u> </u>
Exception 2:	Bldg Cap wo Econo	Exception 3: Water Cooled Ref. w/	Exception 3 System Yes
Chilled Water Sys. Chiller 25% over cøde	=480,000 Btu or 20%	Waterside Economizer Yes Serving chilled beam	Cap. <= 500 tons
	Nici	Sys	
No	Nď	No 	No
]	- 1971 (1976)		—
<u> </u>			\
Exception 4:	Exception 5:	Exception 6:	Exception 7:
Cooling 75% Site →Yes	Special OA Yes- Filtration Needs	Dehumidification Ye with supporting	Heat Pump Loop
HR or Solar	illudion vector	energy analysis	Meeting All Criteria
No	No	No	
		•	No No
Exception 9: Dedicated Server or Yes	Served by 14-1A or 14-1B Y	Exc. 9a: EER & IPLV Yes—	·
Eq Rm	Equipment	15% Over Code	Ĭ
		No	
No	No 	Exc. 9b.	Parf Load:
↓		-No	Note C or better if cap >85,000 Yes
100	▼ Exc. 9c:	EER & IPLV 5% Over Code	Btuh
Exception 10: VRF System Meeting	No ASHRAE 127 EQ. Meets 14-1A/14-1B	-Yes	No
All Criteria Yes	EER/IPLV		
No 1	•		
			THE STATE OF THE S
			Qualifies for Full Air Economizer
Does Not Comply			Exception -
1			Complies

2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Electric Motors MECH-MOT 2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Revised December 2010 Project Address Date For Building Department Use Complete the following for all design A & B squirrel-cage, T-frame induction permanently wired polyphase motors of 1 hp or more having synchronous speeds of 3600, 1800 or 1200 rpm (unless one of the exceptions below applies). Motor Min.Nom. No. or Туре Synch. Full load Location HP (open/closed) Description of Application or Use Efficiency Speed Minimum Nominal Full-Load Efficiencies (%) As of 12/19/2010 Open Motors Enclosed Motors Synchronous 3,600 1.800 1,200 3,600 1,800 1,200 Exceptions: Speed (RPM) Motors in systems designed to use more Motor HP than one speed of a multi-speed motor. 1.0 Motors already included in the efficiency 77.0 85.5 82.5 77.0 82.5 requirements for HVAC equipment (Tables 14-1.5 84.0 86.5 86.5 84.0 87.5 88.5 1A or 14-1B) 85.5 2.0 86.5 87.5 85.5 88.5 88.5 3. Motors that are an integral part (i.e. not 3.0 88.5 85.5 89.5 86.5 89.589.5 easily removed and replaced) of specialized 5.0 86.5 89.5 89.5 88.5 89.5 89.5 process equipment (i.e. equipment which 7.5 88.5 91.0 90.2 89.5 91.7 91.0 requires a special motor, such as an explosion-10.0 89.5 91.7 91.7 90.2 91.7 91.0 proof motor). 15.0 90.2 93.0 91.7 91.0 92.4 91.7 Motors integral to a listed piece of 20.0 91.0 93.0 equipment for which no qualifying motor has 92.4 91.0 93.0 91.7 25.0 91.7 93.6 93.0 91.7 93.6 93.0 been approved (i.e. if the only U.L. listing for the 30.0 91.7 94.1 93.6 equipment is with a less-efficient motor and 91.7 93.6 93.0 there is no energy-efficient motor option). 40.0 92.4 94.1 94.1 92.4 94.1 94.1 50.0 93.0 94.5 94.1 93.0 94.5 94.1 For motors claiming an exception, list motor and 60.0 93.8 95.0 94.5 93.6 95.0 94.5

75.0

100.0

125.0

150.0

200.0

250.0

300.0

350.0

400.0

450.0

500.0

93.6

93.6

94.1

94.1

95.0

95.0

95.4

95.4

95.8

95.8

95.8

95.0

95.4

95.4

95.8

95.8

95.8

95.8

95.8

95.8

96.2

96.2

94.5

95.0

95.0

95.4

95.4

95.4

95.4

95.4

95.8

96.2

96.2

93.6

94.1

95.0

95.0

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note which exception applies.

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Mechanical Permit Plans Checklist 2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Project Address Date The following information is necessary to check a mechanical permit application for compliance with the mechanical requirements in the Washington State Nonresidential Energy Code. Applicability Code Location **Building Department** Section | Component (yes, no, na) Information Required on Plans Notes **HVAC REQUIREMENTS (Sections 1401-1424)** 1411 **Equipment Performance** 1411.1 Minimum efficiency Equipment schedule with type, capacity, efficiency 1411.1 Combustion htg. Indicate intermittent ignition, flue/draft damper & jacket loss 1411.1 Air-cooled chiller Provide total air and water chiller capacity Full-load and NPLV values adjusted for any non-standard conditions 1411.2.1 Water-cooled chiller 1411.4 Pkg. elec. htg.& clg. List heat pumps on schedule Indicate radiant heat system and occupancy controls 1411.5 Unenclosed Heat 1412 **HVAC Controls** 1412.1 Temperature zones Indicate locations on plans 1412.2 Deadband control Indicate 5 degree deadband minimum 1412.3 Humidity control Indicate humidistat 1412.4 Setback and Shutoff Indicate thermostat with 7 day program capability & required setback 1412.4.1 Dampers Indicate damper location, leakage rate, control type, & max. leakage 1412.4.2 Optimum Start Indicate optimum start controls 1412.5 Heat pump control Indicate heat pump thermostant & outdoor lockout on schedule 1412.6 Combustion heating Indicate modulating or staged control 1412.7 Balancing Indicate balancing features on plans Ventilation Control 1412.8 Indicate demand control ventilation for high-occupancy areas Loading Dock & Indicate enclosed loading dock & parking garage ventilation system 1412.9 Garage Ventilation activation and control method. 1422 Thermostat interlock Indicate thermostat interlock on plans 1432.2.1 Temperature Reset Indicate temperature reset method 1413 Air / Water Economizers 1412.1 Single zone systems Indicate multiple cooling stage control capability. 1413.1 Air Econo Operation Indicate 100% capability on schedule 1413.1 Wtr Econo Operation Indicate 100% capacity at 45 degF db & 40 deg F wb Indicate max. OSA condition for design clg load & equipment 1413.2 Wtr Econo Documen performance data. 1413.3 Integrated operation Indicate capability for partial cooling 1413.4 Humidification Indicate direct evap or fog atomization w/ air economizer 1414 **Ducting Systems** 1414.1 Duct sealing Indicate duct design pressures, sealing, and testing requirements 1414.1.2 Low press, duct test Indicate applicable low pressure duct systems shall be leak tested Indicate high pressure duct systems shall be leak tested, and identify 1414.1.3 High press. duct test the location of this ductwork on plans 1414.2 Duct insulation Indicate R-value of insulation on duct 1415 Piping Systems Indicate R-value of insulation on piping 1415.1 Piping insulation 1416 Completion Requirements 1416.3.2 System Balancing Indicate air and water system balancing requirements 1416.3.3 Functional Testing Provide sequence of operations and test procedures. 1416.3.4 Documentation Indicate O&M manuals, record drawings, staff training 1416.3.5 Comm. Report Indicate requirements for final commissioning report 1416.4 Compliance Chklist Submit to building official upon substantial completion. Completed and attached. Equipment schedule with types, input/output, Mechanical Summary Form efficiency, cfm, hp, economizer

 $2009\ Washington\ State\ Energy\ Code\ \underline{Compliance}\ Forms\ for\ Nonresidential\ and\ Multifamily\ Residential$

Mechanical Permit Plans Checklist Continued MECH-CHK									
	2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Revised December 2010 Project Address Date 1/4/2011								
Project Addres	Project Address								
The following Washington S	quirements	in the							
Applicability	Code			Location	Building Department				
(yes, no, na)	Section	Component	Information Required	on Plans	Notes				
SERVICE V	VATER H	IEATING AND HE	ATED POOLS (Sections 1440-1454)		•				
	1440	Service water htg.							
	1441	Elec. water heater	Indicate R-10 insulation under tank						
	1442	Shut-off controls	Indicate automatic shut-off of circulators or heat trace						
	1443	Pipe Insulation	Indicate R-value of insulation on piping						
	1444	Pump Energy	Indicate method of pump energy management (Sec 1438)						
•	1445	Heat Recovery	Indicate preheat capacity as % of peak service water demand.						
	1460	Heated Pools							
	1452	Heat Pump COP	Indicate minimum COP of 4.0						
	1452	Heater Efficiency	Indicate pool heater efficiency						
	1453	Pool heater controls	Indicate switch and 65 degree control						
	1454	Pool covers	Indicate vapor retardant cover						
	1454	Pools 90+ degrees	Indicate R-12 pool cover						
	1455	Heat Recovery	Indicate method and capacity of exhaust air temperature reduction						
COLD STORAGE (Sections 1460-1465)									
	1460	Cold Storage							
	1463	Evaporators	Indicate motor type and speed control						
	1464	Condensors	Indicate condenser cooling type, design wb temp and control						
	1465	Compressors	Indicate design minimum condensing temp and control.						

If "no" is indicated for any item in Sections 1401-1424 or 1440-1465, provide explanation: